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| EXAMINER |
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YOUNG, EDWIN

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3681

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
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Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/536,581

Applicant(s)

ARNDT ET AL.

Examiner

Edwin A. Young

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 May 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date <u>8/22/2005</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This is the first action on the merits for application 10/536,581. Claims 12-25 are currently pending in this application.

Priority

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. PCT/EP03/13011, filed on 11/20/2003.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 8/22/2005 has been considered by the examiner.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the:

- Devices for axial and/or rotational displacement of claim 12;
- Cup springs of claim 20;
- Tothing profile of the straight-toothed planetary gearwheel, with a tip thereof shortened, as a shaft profile for the axial guidance of one or of both half wheels by way of a corresponding inner profile on the shaft of claim 21;
- Adjusting plates of claim 22; and
- Devices to orient said second half wheel with respect to said first half wheel of claim 24;

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must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The abstract of the disclosure is objected to because of the purported merits contained therein. Lines 6-9, "result in a low-noise and low-loss torque transmission with uniform load distribution to the individual planet unit" are purported merits and should be removed from the abstract. Correction is required. See MPEP § 608.01(b).

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The disclosure is objected to because of the following informalities: the specification makes reference to specific claims, i.e. page 7, lines 11-12. All references to specific claims within the specification should be removed.

Appropriate correction is required.

Claim Objections

Claim 20 is objected to because of the following informalities: line 2, "utilizing cup springs as spring element" should be changed to -utilizing cup springs as a spring element-. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 12

- The terms "low-loss" and "low-noise" in claim 12 are relative terms which render the claim indefinite. The terms "low-loss" and "low-noise" are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear what would constitute a "low-loss" and "low-noise" transfer.

- Lines 7-8, "an output shaft" appears to be a double inclusion of the output shaft recited in line 3. Claim 12, lines 7-8, "an output shaft" should be changed to - -the output shaft- -.
- Claim 12 recites the limitation "the straight-toothed planetary gearwheel" in line 9. There is insufficient antecedent basis for this limitation in the claim. Line 9, "the straight-toothed planetary gearwheel" should be changed to - -a straight-toothed planetary gearwheel- -.
- Lines 9-10, "a ringwheel" appears to be a double inclusion of the ringwheel recited in line 5. Claim 12, lines 9-10, "a ringwheel" should be changed to - -the ringwheel- -.
- Claim 12 recites the limitation "the planet shaft" in lines 11-12. There is insufficient antecedent basis for this limitation in the claim. Lines 11-12, "the planet shaft" should be changed to - -a planet shaft- -. Furthermore, it is unclear what applicant means is referring to the planet shaft, as the specification does not use this term. Unless otherwise noted, it will be assumed that the planet shaft is referring to the shaft that extends through the planetary gearwheel.

Claims 16-18 and 23

- The claims recite the limitation "the planet shaft." There is currently insufficient antecedent basis for this limitation in the claims. However, if claim 12 is amended as suggested above regarding "the planet shaft," the antecedent basis issues concerning claims 16-18 and 23 will no longer be

applicable. For this reason, applicant is further encouraged to amend claim 12 as described above.

Claim 17

- It is unclear what the limitation “non-positively connecting” in line 2 is referring to. Specifically, it is unclear what “non-positively” means.

Claim 18

- It is unclear what the limitation “positively connecting” in line 2 is referring to. Specifically, it is unclear what “positively” means.

Claim 20

- It is unclear how cup springs are utilized as a spring element.

Claim 21

- It is unclear how the toothing profile of the straight-toothed planetary gearwheel is structured and related to the shaft.

Claim 24

- The terms “relatively low” and “relatively high” in claim 24 are relative terms which render the claim indefinite. The terms “relatively low” and “relatively high” are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear what the terms are relative to.
- Claim 24 recites the limitation “the planet shaft” in line 15. There is insufficient antecedent basis for this limitation in the claim. Line 15, “the

planet shaft" should be changed to - -a planet shaft- -. Furthermore, it is unclear what applicant means is referring to the planet shaft, as the specification does not use this term. Unless otherwise noted, it will be assumed that the planet shaft is referring to the shaft that extends through the planetary gearwheel.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12, 13, 15, 16, 18, 19, 21 and 23-25 are rejected under 35 U.S.C. 102(b) as being anticipated by THORNTON (U.K. 662,905).

Regarding claim 12 as best understood, THORNTON discloses a method for transfer of an introduction torque (see Fig. 1). The method comprising the steps of:

- Transferring the introduction torque via an internally straight-toothed ringwheel (17) to a plurality of two to six planetary units (18, 22, 22') fixedly mounted radially with respect to one another in a planet carrier (13) and to an oppositely helix-toothed sun pinion (24, 24') of an output shaft (23);
- Rigidly connecting a straight-toothed planetary gearwheel (18) with the ringwheel (17) and one of two oppositely helix-toothed half wheels of a

double gearwheel (22, 22'), meshing with the sun pinion (24, 24'), of each planetary unit to one another on a planet shaft (19);

- Assembling individual planetary units into bearings (20, 21) of the planet carrier, and thereby placing a respective second half wheel (22') relative to the first half wheel (22), by way of devices for axial and/or rotational displacement, into a position of predetermined tooth carrying and load distribution between the individual planetary units and locking the second half wheel in the position (see page 1, column 2, lines 79-87 and page 2, column 1, lines 20-37).

Regarding claim 13 as best understood, THORNTON discloses effecting the axial and/or rotational displacement of the second half wheel successively on each of the individual planetary units (see page 1, column 2, lines 79-87 and page 2, column 1, lines 48-54).

Regarding claim 15 as best understood, THORNTON discloses assigning the position of the first half wheel of the double gearwheel to the second half wheel of the double gearwheel by axially displacing the first and second half wheels relative to one another (see page 1, column 2, lines 79-87 and page 2, column 1, lines 20-54).

Regarding claim 16 as best understood, THORNTON discloses following a position assignment, connecting the second half wheel to the planet shaft and/or to the first half wheel and locking the second half wheel in that position (see page 1, column 2, lines 79-87).

Regarding claim 18 as best understood, THORNTON discloses positively connecting the second half wheel to the planet shaft and/or to the first half wheel (see page 1, column 2, lines 79-87).

Regarding claim 19 as best understood, THORNTON discloses locking the second half wheel axially resiliently with respect to the first half wheel (see page 1, column 2, lines 79-87).

Regarding claim 21 as best understood, THORNTON discloses using a toothing profile of the straight-toothed planetary gearwheel as a shaft profile for the axial guidance of one or of both half wheels by way of a corresponding inner profile on the shaft (see Fig. 1).

Regarding claim 23 as best understood, THORNTON discloses introducing the planetary units into bearing points (20, 21) in a divided planet carrier (13, 11) radially with respect to an axial direction the planet shaft.

Regarding claim 24 as best understood, THORNTON discloses a single-step epicyclic transmission (see Fig. 1) comprising:

- A planet carrier (13);
- A plurality of planetary units (18, 22, 22');
- An oppositely helix-toothed double gearwheel (22, 22') formed with two half wheels;
- A straight-toothed planetary gearwheel (18) meshing with a ringwheel (17) connected to the input shaft (14);

- Devices configured, during mounting of individual said planetary units in said planet carrier, to orient said second half wheel, for uniform load distribution to all said planetary units, with respect to said first half wheel in an axial direction and/or by rotation about a planet shaft and to lock said second half wheel (see page 1, column 2, lines 79-87 and page 2, column 1, lines 20-54).

The elements being arranged in the manner specified by claim 24.

Regarding claim 25, THORNTON discloses said plurality of planetary units including two to six planetary units (see page 1, column 2, lines 71-73).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 12, 13, 15, 17, 21 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over BAKER (US 3,245,279) in view of THORNTON (U.K. 662,905).

Regarding claim 12, BAKER discloses a method for transfer of an introduction torque (see Fig. 4). The method comprising the steps of:

- Transferring the introduction torque via a ringwheel (30) to a plurality of two to six planetary units (unlabeled unit containing both helical gears and the straight toothed gear) fixedly mounted radially with respect to one

another in a planet carrier (55, 56) and to a sun pinion of an output shaft (20);

- Assembling individual planetary units into bearings (27, 28) of the planet carrier, and thereby placing a respective second half wheel relative to the first half wheel, by way of devices for axial and/or rotational displacement, into a position of predetermined tooth carrying and load distribution between the individual planetary units and locking the second half wheel in the position.

However, BAKER does not disclose the straight-toothed planetary gearwheel meshing with the ringwheel and the oppositely helix-toothed half wheels meshing with the sun pinion.

THORNTON discloses a method for transferring an introduction torque, as described in detail above, wherein a straight-toothed planetary gearwheel meshes with the ringwheel and the oppositely helix-toothed half wheels mesh with the sun pinion.

Regarding claim 12, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to reverse the planetary unit of BAKER such that the straight-toothed planetary gearwheel would mesh with a corresponding ringwheel and the oppositely helix-toothed half wheels would mesh with a corresponding sun pinion, in light of the teachings of THORNTON, in order to reduce the material needed to manufacture the ringwheel.

Regarding claim 13 as best understood, BAKER discloses effecting the axial and/or rotational displacement of the second half wheel successively on each of the individual planetary units (see column 2, lines 41-63).

Regarding claim 15 as best understood, THORNTON discloses assigning the position of the first half wheel of the double gearwheel to the second half wheel of the double gearwheel by axially displacing the first and second half wheels relative to one another (see page 1, column 2, lines 79-87 and page 2, column 1, lines 20-54).

Regarding claim 16 as best understood, BAKER discloses following a position assignment, connecting the second half wheel to the planet shaft and/or to the first half wheel and locking the second half wheel in that position (column 2, lines 41-63).

Regarding claim 18 as best understood, BAKER discloses positively connecting the second half wheel to the planet shaft and/or to the first half wheel (see column 2, lines 41-63).

Regarding claim 19 as best understood, BAKER discloses locking the second half wheel axially resiliently with respect to the first half wheel (see column 2, lines 41-63).

Regarding claim 21 as best understood, BAKER discloses using a toothing profile of the straight-toothed planetary gearwheel as a shaft profile for the axial guidance of one or of both half wheels by way of a corresponding inner profile on the shaft (see Fig. 4).

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Regarding claim 23 as best understood, BAKER discloses introducing the planetary units into bearing points (27, 28) in a divided planet carrier (55, 56) radially with respect to an axial direction the planet shaft.

Regarding claim 24 as best understood, BAKER discloses a single-step epicyclic transmission (see Fig. 4) comprising:

- A planet carrier (55, 56);
- A plurality of planetary units (unlabeled unit containing both helical gears and the straight toothed gear);
- An oppositely helix-toothed double gearwheel formed with two half wheels;
- A straight-toothed planetary gearwheel meshing;
- A ringwheel (30) connected to the input shaft (21);
- Devices configured, during mounting of individual said planetary units in said planet carrier, to orient said second half wheel, for uniform load distribution to all said planetary units, with respect to said first half wheel in an axial direction and/or by rotation about a planet shaft and to lock said second half wheel (see column 2, lines 41-63).

However, BAKER does not disclose the straight-toothed planetary gearwheel meshing with the ringwheel and the oppositely helix-toothed half wheels meshing with the sun pinion.

THORNTON discloses a method for transferring an introduction torque, as described in detail above, wherein a straight-toothed planetary gearwheel meshes with the ringwheel and the oppositely helix-toothed half wheels mesh with the sun pinion.

Regarding claim 24, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to reverse the planetary unit of BAKER such that the straight-toothed planetary gearwheel would mesh with a corresponding ringwheel and the oppositely helix-toothed half wheels would mesh with a corresponding sun pinion, in light of the teachings of THORNTON, in order to reduce the material needed to manufacture the ringwheel.

Regarding claim 25, THORNTON discloses said plurality of planetary units including two to six planetary units (see page 1, column 2, lines 71-73).

Claims 13-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over BAKER in view of THORNTON as applied to claim 12 above, and further in view of BENNETT et al. (US 3,307,433).

Regarding claim 13 as best understood, BAKER, as modified by THORNTON, discloses the method for torque transfer according to claim 12, described in detail above, but does not show effecting the axial and/or rotational displacement of the second half wheel successively on each of the individual planetary units.

BENNETT et al. discloses a planetary gearing (see Figs. 1-7) having a pair of oppositely helix-toothed half wheels (74, 76) of a double gearwheel being screwed together.

Regarding claim 13, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide the method for torque transfer of BAKER, as modified by THORNTON, with the ability to effect the axial and/or rotational displacement of the second half wheel successively on each of the individual planetary units, in light of the teachings of BENNETT et al., in order to adjust the gear teeth of the respective parts (see BENNETT et al., column 1, lines 47-48).

Regarding claim 14 as best understood, BENNETT et al. discloses assigning the position of the first half wheel of the double gearwheel to the second half wheel of the double gearwheel by rotating the first and second half wheels relative to one another (see Figs. 3-7).

Regarding claim 15 as best understood, BENNETT et al. discloses assigning the position of the first half wheel of the double gearwheel to the second half wheel of the double gearwheel by axially displacing the first and second wheels relative to one another (see Figs. 3-7).

Regarding claim 16 as best understood, BENNETT et al. discloses connecting the second half wheel to the planet shaft and/or to the first half wheel and locking the second half wheel in that position (see Figs. 3-7).

Regarding claim 17 as best understood, BENNETT et al. discloses non-positively connecting the second half wheel to the planet shaft and/or to the first half wheel (see Figs. 3-7).

Regarding claim 19 as best understood, BENNETT et al. discloses locking the second half wheel axially resiliently with respect to the first half wheel (see Figs. 3-7).

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Claims 13 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over BAKER, as modified by THORNTON, as applied to claim 12 above, and further in view of GEIGER (US 3,636,789).

Regarding claim 13 as best understood, BAKER, as modified by THORNTON, discloses the method for torque transfer according to claim 12, described in detail above, but does not show effecting the axial and/or rotational displacement of the second half wheel successively on each of the individual planetary units.

GEIGER discloses a gear drive (see Fig. 1) wherein a cup spring (3) is used to effect the axial displacement of shaft (2) containing oppositely helix-toothed half wheels (2c, 2b).

Regarding claim 13, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide the method of torque transfer of BAKER, as modified by THORNTON, with cup springs to effect the axial and/or rotational displacement of the second half wheel successively on each of the individual planetary units, in light of the teachings of GEIGER, in order to reduce gear play (see GEIGER, column 4, lines 1-15).

Regarding claim 19 as best understood, GEIGER discloses locking the second half wheel axially resiliently with respect to the first half wheel.

Regarding claim 20 as best understood, GEIGER discloses utilizing cup springs as a spring element (see Fig. 1).

Claims 13, 15-17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over BAKER, as modified by THORNTON, as applied to claim 12 above, and further in view of MORROW et al. (US 6,189,397).

Regarding claim 13 as best understood, BAKER, as modified by THORNTON, discloses the method for torque transfer according to claim 12, described in detail above, but does not show effecting the axial and/or rotational displacement of the second half wheel successively on each of the individual planetary units.

MORROW et al. discloses a gear drive (see Fig. 1) wherein spacers (21) are utilized to effect the axial displacement of oppositely helix-toothed half wheels.

Regarding claim 13, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide the method of torque transfer of BAKER, as modified by THORNTON, with spacers to effect the axial and/or rotational displacement of the second half wheel successively on each of the individual planetary units, in light of the teachings of MORROW et al., in order to balance the load (see MORROW et al., column 5, lines 35-40).

Regarding claim 15 as best understood, MORROW et al. discloses assigning the position of the first half wheel of the double gearwheel to the second half wheel of the double gearwheel by axially displacing the first and second half wheels relative to one another (see Fig. 1).

Regarding claim 16 as best understood, MORROW et al. discloses connecting the second half wheel to the planet shaft and/or to the first half wheel and locking the second half wheel in that position (splined connection).

Regarding claim 17 as best understood, MORROW et al. discloses non-positively connecting the second half wheel to the planet shaft and/or to the first half wheel (see Fig. 1).

Regarding claim 22 as best understood, MORROW et al. discloses adjusting the second half wheel in axial direction with respect to the first half wheel by inserting adjusting plates (21) between the first and second half wheels.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. EGGINS (US 3,545,296) discloses a gear arrangement (see Figs. 4 and 5).


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edwin A. Young whose telephone number is 571-272-4781. The examiner can normally be reached on M-TH 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Marmor can be reached on 571-272-7095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EAY
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SHERRY ESTREMSKY
PRIMARY EXAMINER
AU3681 3-9-07